Case Report

Benign collision tumor of the ovary comprising serous cystadenoma and thecoma in an adolescent female: A rare case report

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ABSTRACT

Collision tumors of the ovary are rare pathological entities defined by the coexistence of two histologically distinct neoplasms within the same ovary, with no microscopic admixture of their cellular components. The pairing of a benign serous cystadenoma and an ovarian thecoma is among the rarest such combinations, and its occurrence in an adolescent female is exceptional. We report the case of a 16-year-old girl who presented with right iliac fossa pain and menstrual irregularities of 4 months' duration. Imaging revealed a large right adnexal mass with mixed solid-cystic morphology that raised concern for malignancy. Histopathological examination of the surgically excised specimen confirmed a benign collision tumor comprising a serous cystadenoma and a thecoma with a remnant cystic follicle, with no evidence of malignancy in either component. This case underscores the indispensable role of histopathology in distinguishing this entity from complex malignant neoplasms and highlights its critical implications for fertility-preserving management in young patients.

Key words: Adolescent ovarian tumor, Benign, Collision tumor, Serous cystadenoma, Thecoma

Collision tumors are uncommon neoplasms defined by the coexistence of two histologically distinct tumor populations within a single organ, without cellular intermixing or histological transition at their shared boundary [1]. Although described across various organs, including the liver, kidney, lung, stomach, esophagus, brain, and bone, their occurrence in the ovary is particularly rare [1,2]. Among ovarian collision tumors, the pairing of teratoma with cystadenoma or cystadenocarcinoma is most common [3,4], with serous cystadenoma-teratoma, serous papillary cystadenocarcinoma-granulosa cell tumor, and mucinous cystadenoma-teratoma combinations also reported [2]. The pairing of a serous cystadenoma with an ovarian thecoma is considerably rarer, and its occurrence in an adolescent is virtually unreported.

We present this case for three reasons: Both component tumors are individually atypical in adolescence, making their simultaneous occurrence in a 16-year-old girl doubly uncommon; the mixed solid-cystic imaging appearance closely mimicked a malignant or borderline neoplasm, illustrating the diagnostic uncertainty such lesions pose preoperatively; and accurate histopathological characterization enabled fertility-preserving surgery, a decision of lasting significance for a young patient. This case thus adds to the limited literature on this entity and offers a useful reference for clinicians encountering a complex adnexal mass in a young female.

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CASE REPORT

A 16-year-old girl presented to the outpatient department with a 4-month history of progressive, pricking-type pain in the right iliac fossa. She had been experiencing irregular menstrual cycles since early 2024, periods recurring approximately every 21 days with moderate flow lasting 5–6 days and occasional passage of clots. In the 4 days preceding presentation, she had also experienced multiple episodes of low-grade fever. She denied chills, burning micturition, cough, nausea, vomiting, or weight loss. Menarche had occurred at 14 years of age with previously regular cycles. Family history was non-contributory.

On abdominal examination, the abdomen was soft and non-tender. A soft-to-firm, mobile mass was palpable in the right iliac fossa, extending to the level of the umbilicus. No guarding or rigidity was elicited. Per-vaginal examination was deferred, given the patient's age.

Pelvic ultrasonography identified a large right adnexal mass with mixed solid and cystic components, raising clinical suspicion for a complex or malignant

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ovarian neoplasm. Serum tumor markers – cancer antigen-125, alpha-fetoprotein, lactate dehydrogenase, and beta-human chorionic gonadotropin – were within normal limits. Hormonal profiling (estrogen, follicle-stimulating hormone, luteinizing hormone, progesterone, and inhibin) was deferred pending histopathological confirmation. The original ultrasonographic images could not be retrieved for reproduction in this report.

The pathology department received a specimen labeled ovarian mass with right ovary, comprising intimately connected solid and cystic components joined by a fibrous pedicle, fixed in 10% buffered formalin. The solid component measured 12 × 9.5 × 1.5 cm. Its outer surface was smooth and glistening, pinkish-white to translucent, with prominent congested surface vessels. Serial sectioning revealed a soft-to-firm, gelatinous, and focally edematous cut surface. No hemorrhage, necrosis, or calcification was identified (Fig. 1a). Attached to the solid component was a cystic mass measuring approximately 12 cm in maximum diameter, with a smooth gray-white outer wall and focal vascular congestion. On opening, clear straw-colored serous fluid was drained. The cyst was unilocular with a smooth, glistening inner lining approximately 0.2 cm in thickness. No papillary excrescences, mural nodules, solid proliferative areas, or intracystic hemorrhage were identified (Fig. 1b).

Multiple representative sections were taken from the solid component, cyst wall, fibrous septa, and critically, the interface between the two components. The solid component displayed fascicles of spindle-shaped cells with pale, lipid-laden cytoplasm and bland oval nuclei, morphological features in keeping with an ovarian thecoma. A remnant cystic follicle was noted within the background ovarian stroma. No fibromatous element, cytological atypia, increased mitotic activity, or evidence of malignancy was identified. Immunohistochemistry was not performed due to cost restraints; the benign diagnosis was based on these characteristic histomorphological features. The cystic component showed a single layer of cuboidal to columnar ciliated epithelium resting on a thin fibrous wall, consistent with the diagnosis of a serous cystadenoma. Sections taken from the fibrous septa at the junction of the two components revealed an abrupt, sharply defined boundary between the thecomatous and epithelial populations, with no histological transition or cellular intermingling across the interface. This clear-cut separation established the lesion as a true collision tumor rather than a mixed or composite neoplasm (Fig. 2). Final histopathological diagnosis offered: Benign collision tumor of right ovary comprising serous cystadenoma and ovarian thecoma. There is no evidence of malignancy.

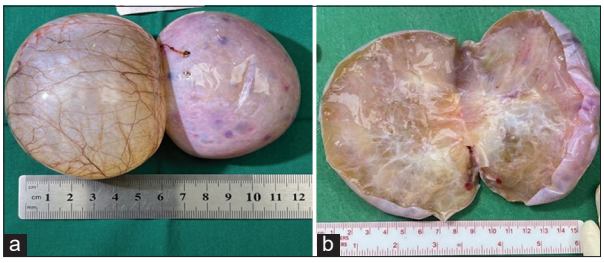


Figure 1: (a) Gross specimen of the excised ovary showing left-sided thin-walled cystic component and right-sided relatively thick-walled solid component separated by thin fibrous pedicle; (b) Gross specimen of the solid ovarian component which was soft-to-firm, gelatinous, with focally edematous cut surface

DISCUSSION

The diagnostic criterion that defines a collision tumor, two histologically distinct neoplasms sharing a single organ without microscopic intermixing at their common boundary, was clearly satisfied in this case. The sharply demarcated interface between the thecomatous solid component and the serous cystadenoma, devoid of any transitional histology within the fibrous septa, rules out a mixed or composite neoplasm and establishes each tumor as independently arising [1,2].

The pathogenesis of ovarian collision tumors is not yet fully elucidated. The prevailing view holds that two unrelated neoplasms develop coincidentally in anatomical proximity, each following its own biological course [4,5]. Alternative explanations, including a shared carcinogenic microenvironment or paracrine cross-talk whereby one tumor creates conditions favorable for the emergence of the other, have been advanced, though none has been substantiated conclusively. The total absence of histological blending in the present specimen lends further support to the theory of independent, coincidental origin [4,5].

Each component merits individual consideration in the context of this patient's age. Serous cystadenomas constitute roughly 20–25% of benign ovarian neoplasms

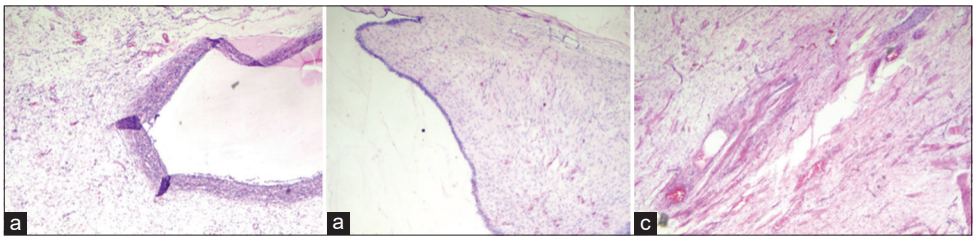


Figure 2: (a) Histopathological photomicrograph, high-power view showing a thecoma with a remnant cystic ovarian follicle. Spindle-shaped theca cells were noted in fascicular pattern (hematoxylin and eosin [H&E], ×200); (b) Histopathological photomicrograph-serous cystadenoma with a single layer of ciliated columnar epithelium on a thin fibrous wall (H&E, ×200); (c) Histopathological photomicrograph-interface pedicle zone showing pale, thecomatous component (top) and ovarian type stroma (bottom) (H&E, ×100)

and are most commonly encountered during the reproductive years; histologically, they are lined by a single layer of ciliated, tubal-type columnar epithelium without stratification or atypia [6,7]. Histopathological features of each tumor component are shown in Table 1. Thecomas, by contrast, account for approximately 1–2% of all ovarian tumors and are predominantly a condition of peri- and postmenopausal women; in the uncommon circumstance of adolescent occurrence, autonomous estrogen elaboration may manifest as irregular uterine bleeding or isosexual precocious puberty [8,9]. The shortened cycle intervals and clot passage documented in this patient may therefore reflect subclinical estrogenic stimulation originating from the thecomatous component, an association that justifies prospective hormonal evaluation at follow-up. At the time of this report, formal post-operative follow-up data were not yet available; hormonal reassessment and clinical review are planned at the patient's next scheduled visit [10].

From an imaging perspective, the mixed solid-cystic architecture of the excised mass raised genuine pre-operative concern for malignancy, a pattern repeatedly highlighted in published collision tumor series where cross-sectional imaging is inherently non-specific and tumor markers yield little discriminatory value in entirely benign combinations [3,5]. Definitive characterization therefore rests wholly on meticulous histopathological sampling, with particular emphasis on the inter-component junction. Careful sampling of the interface zone is essential, as inadequate representation may result in omission of one tumor component, leading to an incomplete diagnosis and potentially inappropriate clinical management. Differential diagnosis of a mixed solid-cystic adnexal mass in an adolescent is shown in Table 2.

The therapeutic implications are most consequential in this adolescent setting. Had the pre-operative imaging suspicion of malignancy been acted upon without histological corroboration, oophorectomy, or formal staging surgery – with its irreversible impact on reproductive potential – might have been performed. Instead, the confirmed benignity of both components supported ovarian cystectomy with full preservation of the contralateral ovary, fallopian tube, and uterus. This outcome reinforces the principle that in young patients with complex adnexal masses, intraoperative frozen-section analysis or deferral to definitive paraffin histology should precede any irreversible surgical decision [4].

Table 1: Histopathological features of each tumor component

Feature	Solid component (Thecoma)	Cystic component (Serous cystadenoma)
Cell type	Spindle-shaped theca cells in fascicles	Single layer of cuboidal–columnar ciliated epithelium
Cytoplasm	Pale, lipid-laden	Scant to moderate
Nuclear atypia	Absent	Absent
Mitoses	Absent	Absent
Special feature	Remnant cystic follicle in background stroma	Thin fibrous wall; clear serous luminal content
Interface	Abrupt demarcation – no admixture with the cystic component	Abrupt demarcation – no admixture with the solid component
Malignancy	Absent	Absent

Table 2: Differential diagnosis of a mixed solid-cystic adnexal mass in an adolescent

Diagnosis	Distinguishing features	Histology key point	Tumor markers	Management
Collision tumor (present case)	Two discrete benign components; adolescent; normal markers	Abrupt interface – no admixture	Normal	Conservative cystectomy
Fibrothecoma	Solid mass; may be hormonally active	Fibrous and thecomatous areas intermixed as a single lesion	Normal	Surgical excision
Teratoma+Cystadenoma	Most common ovarian collision combination	Tri-germ-layer elements alongside epithelial lining	AFP elevated if immature component present	Cystectomy/ Oophorectomy
Granulosa cell tumor	Precocious puberty; menorrhagia	Call-Exner bodies; nuclear grooves (coffee-bean nuclei)	Inhibin↑, AMH↑	Staging surgery
Malignant germ cell tumor	Rapid growth; young female; systemic symptoms	Malignant germ cells; brisk mitotic activity; necrosis	AFP/hCG/LDH↑	Staging surgery+Chemotherapy

AFP: Alpha-fetoprotein, AMH: Anti-Müllerian hormone, hCG: Human chorionic gonadotropin, LDH: Lactate dehydrogenase

This report has certain limitations. Immunohistochemistry was not performed to further confirm the diagnosis of thecoma, primarily owing to cost constraints; the diagnosis instead relied on characteristic histomorphological features. The original ultrasonographic images could not be retrieved for inclusion in this report from the outsourced radiology center. Formal post-operative follow-up data, including clinical and hormonal reassessment, were not available at the time of this submission and are planned prospectively.

CONCLUSION

Collision tumors of the ovary are rare, but the cost of missing one in an adolescent is high. This case demonstrates that meticulous histopathological evaluation is the only tool capable of confirming benignity, excluding malignancy, and justifying the fertility-preserving surgery that a young female patient deserves.

REFERENCES

1. Mukilarasi KR, Kavita V, Kavitha A. Collision tumor of ovary - case report. Indian J Pathol Oncol 2023;10:201-3.
2. Choudhary S, Adisesha S. Collision tumors of ovary: A rare phenomenon. Int J Case Rep Images 2012;3:68-70.
3. Pal Sharan J, Dorothy LF, Nayak SR, Arun R, Deepika B. Collision tumors of ovary: A rare entity. Int J Innov Res Dev 2014;3:424-7.
4. Karki D, Karki S, Adhikari P, Dahal M, Adhikari M, Adhikari B. Collision tumor of ovary: A rare entity. Asian J Med Sci 2018;9:61-4.
5. Shopov S. A collision between fibroma and serous ovarian cystadenoma mimicking carcinoma. Folia Med (Plovdiv) 2019;61:634-8.
6. Mongelli M, Silvestris E, Loizzi V, Cormio G, Cazzato G, Arezzo F. A rare case of collision tumours of the ovary: An ovarian serous cystadenoma coexisting with fibrothecoma. Diagnostics (Basel) 2022;12:2840.
7. Bordoloi P, Devi J, Dowerah E. Histopathology of ovarian collision tumor: A rare case report. Ann Pathol Lab Med 2025;12:C37-41.
8. Maddipati SS, Sudha CP, Sowmya K. Collision tumor of ovary: A case report on bilateral dermoid cyst with co-existing unilateral mucinous cystadenoma. Int J Reprod Contracept Obstet Gynecol 2020;9:3078-80.
9. Rjoop A, Obiedat R, Al-Oqaily A, Abu Baker S, Matalka I. Ovarian collision tumour comprising fibroma and serous cystadenoma: A case report. Case Rep Womens Health 2024;42:e00602.
10. Vernekar VM, Gollar PF, Sana S, Sampath Kumar S. Ovarian collision tumour: A rare case of serous cystadenoma with granulosa cell tumor of ovary. Int J Reprod Contracept Obstet Gynecol 2023;12:1879-82.

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